BAUXITE AND ALUMINA

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Bauxite is a naturally occurring, heterogeneous material comprised primarily of one or more aluminum hydroxide minerals plus various mixtures of silica (SiO_2), iron oxide (Fe_2O_3), titania (TiO_2), aluminosilicates (clay, etc.), and other impurities in trace amounts. The principal aluminum hydroxide minerals found in varying proportions within bauxite are gibbsite [$Al(OH)_3$] and the polymorphs, boehmite and diaspore [both AlO(OH)].

Bauxite is typically classified according to its intended commercial application, such as abrasive, cement, chemical, metallurgical, and refractory. Of all bauxite mined, approximately 85% is converted to alumina (Al_2O_3) for the production of aluminum metal, and an additional 10% is converted to various forms of specialty aluminas. The remaining 5% is used directly for nonmetallurgical bauxite applications. The bulk of world bauxite production is used, therefore, as feed for the manufacture of alumina via a wet chemical caustic leach process known as the Bayer process. Most of the alumina produced from this refining process is smelted using the Hall-Héroult process to produce aluminum metal by electrolytic reduction in a molten bath of natural or synthetic cryolite (Na_3AlF_6).

Specifications for the nonmetallurgical grades of bauxite are more stringent than those for bauxite used to produce alumina and are based on the processing requirements and special properties required of their final commercial products. The natural chemical impurities that exist within these specialty-grade ores are not chemically removed by refining because the ores are used as direct feed for the production of their ultimate end products. Although global figures on nonmetallurgical bauxite production and consumption are not commonly available, the principal industrial end uses are considered to be in refractories and abrasives, followed by cement applications. In addition, the aluminum chemicals and steel industries also consume significant quantities of bauxite.

Twenty-one countries reported bauxite mine production in 2004, and total world production increased by about 3% compared with that of 2003 (table 11). Australia, Brazil, China, and Guinea accounted for about two-thirds of the total bauxite mined in 2004.

At the current rate of consumption, total reported world reserves of bauxite are sufficient to meet cumulative world primary aluminum metal demand well beyond the 21st century. Although bauxite reserves are unevenly distributed throughout the world, with approximately 90% in about a dozen countries, the sheer magnitude of these reserves (23 billion metric tons) is sufficient to ensure a readily accessible supply for the future (Plunkert, 2005).

U.S. production of alumina (calcined equivalent), derived almost exclusively from imported metallurgical-grade bauxite, increased 10% compared with that of 2003 (table 2). An estimated 92% of the alumina shipped by U.S. refineries went to domestic primary smelters for aluminum metal production. Consumption by the abrasives, chemicals, refractories, and specialties industries accounted for the remainder of U.S. alumina shipments.

World output of alumina increased by 4% in 2004 compared with that of 2003. The principal producing countries, in descending order of alumina output, were Australia, China, the United States, Brazil, and Jamaica. These countries accounted for 64% of the world's production; Australia alone accounted for 28% of total world production (table 12).

Legislation and Government Programs

In February, the Defense National Stockpile Center announced the sale of approximately 41,700 calcined metric tons (41,000 calcined long tons) of refractory-grade bauxite to Harbison Walker Refractories Co. for an approximate value of $3.5 million (Defense Logistics Agency, 2004b).

In October 2004, the Defense Logistics Agency released its Annual Materials Plan (AMP) for the National Defense Stockpile for fiscal year 2005 (October 1, 2004, to September 30, 2005). The 2005 AMP provided for the sale of 43,700 calcined metric tons (43,000 calcined long tons) of refractory-grade bauxite in fiscal year 2005. This was the maximum amount recommended for disposal during the fiscal year, and the actual level of sales would depend upon prevailing market conditions and available inventory (Defense Logistics Agency, 2004a). In February 2005, the AMP was revised to include the authority to sell 2.03 million metric tons (Mt) (2 million long tons) of Jamaica-type, metallurgical-grade bauxite. This represented inventory that had been sold previously, but not yet shipped (Defense Logistics Agency, 2005a).

At yearend 2004, the uncommitted inventories for Jamaica-type, metallurgical-grade bauxite and calcined refractory-grade bauxite were depleted (Defense Logistics Agency, 2005b).

Production

Bauxite.—For many years, domestic mines have supplied less than 1% of the U.S. requirement for bauxite. Essentially all the domestic bauxite production was used in nonmetallurgical products, such as abrasives, chemicals, proppants, and refractories. Thus, the United States imported almost all the bauxite, especially the metallurgical grade, that it required.

Alumina.—Century Aluminum Co. and Noranda Inc. purchased Kaiser Aluminum Corp.'s Gramercy, LA, alumina refinery and related bauxite assets in Jamaica. Century and Noranda each paid one-half of the approximately $23 million purchase price. The Gramercy refinery has the capacity to produce 1.25 million metric tons per year (Mt/yr) of alumina (Century Aluminum Co., 2004a).

On January 30, Ormet Corp. filed voluntary petitions for Chapter 11 protection in the U.S. Bankruptcy Court for the Southern District of Ohio. Ormet operated a 600,000-metric-ton-per-year (t/yr) alumina refinery in Burnside, LA (Ormet Corp., 2004).

China's state-owned metals trading company, China Minmetals Nonferrous Metals Co. Ltd. (CMN) acquired a 51% interest in Sherwin Alumina Co. (a subsidiary of BPU Reynolds Inc.). In 2003, CMN had signed a 3-year, 160,000-t/yr supply contract with Sherwin. The alumina refinery, located in Corpus Christi, TX, has the capacity to produce 1.4 Mt/yr of metallurgical-grade alumina and 300,000 t/yr of chemical-grade alumina-hydrate. The plant would continue to be managed by BPU's management team, the same team that has managed it since it was acquired from Alcoa Inc. in December 2000 (Mining Journal, 2004b).

Consumption

Bauxite.—Total domestic consumption of bauxite increased by about 20% compared with that of 2003. In 2004, 93% of the bauxite consumed in the United States was refined to alumina (an estimated 2.3 metric tons (t) of dried bauxite was required to produce 1 t of alumina); the remaining 7% was consumed in nonmetallurgical applications (table 4). Domestic production and consumption data for bauxite and alumina were obtained by the U.S. Geological Survey from three voluntary surveys of U.S. operations. One of these surveys is "Bauxite Consumption," sent to 31 operations, 22 of which responded, representing 63% of the bauxite consumed for uses other than cement listed in table 4.

Alumina.—An estimated 92% of the alumina shipped by U.S. alumina plants went to primary aluminum smelters for metal production. In 2004, 14 domestic primary aluminum smelters consumed 4.93 Mt of alumina. Consumption in various forms by the abrasives, chemicals, refractories, and specialties industries accounted for the remainder of U.S. alumina use.

Prices

Most metallurgical-grade bauxite and alumina were purchased under long-term contracts. Contract terms for these commodities normally were not made public. Spot prices for metallurgical-grade alumina and specialty forms of bauxite and alumina for nonmetallurgical applications, however, were published in trade journals.

Industrial Minerals (2004b) quoted end-of-year prices for several types of imported refractory-grade bauxite from China and Guyana. The price quotes for Chinese refractory-grade bauxite, minimum 87% Al_2O_3 free on board (f.o.b.) Chinese ports, were as follows: Shanxi, shaft, lump, $135 to $145 per metric ton; Shanxi rotary, lump, $150 to $160 per ton; and Guizhou, rotary, lump, $145 to $155 per ton. The price range for Guyanese refractory-grade bauxite was $160 to $170 per ton, f.o.b. barge, U.S. Gulf Coast. The 2004 annual average values of U.S. imports of metallurgical-grade bauxite are listed in table 7.

The market or spot prices for alumina fluctuated in 2004 amid tight global supplies and strong demand from China. According to Metal Bulletin, metallurgical-grade alumina spot prices on international markets began 2004 at $330 to $350 per ton. In April, the price range reached a high for the year of $470 to $490 per ton. In May, the price began to decrease and reached a low for the year of $310 to $330 per ton in early July. By mid-September, the price began to increase again, and by yearend, the price range had reached $390 to $420 per ton. Trade data released by the U.S. Census Bureau indicated that the 2004 annual average value of U.S. imports of calcined alumina was $278 per ton, free alongside ship (f.a.s.) port of shipment, and $287 per ton, cost, insurance, and freight (c.i.f.) U.S. ports.

Trade

In addition to the materials listed in tables 8-10, various specialty aluminum compounds were also traded. The compounds exported in 2004 included 13,900 t of aluminum oxide abrasives; 12,400 t of aluminum chloride; 9,610 t of aluminum sulfate; and 6,060 t of fluoride-base compounds of aluminum, including synthetic cryolite and aluminum fluoride. The compounds imported in 2004 included 232,000 t of aluminum oxide abrasives; 5,990 t of aluminum sulfate; 4,700 t of fluoride-base aluminum compounds; and 1,170 t of aluminum chloride.

World Review

In 2004, world production of bauxite increased 3% compared with that of 2003 (table 11). Mine production was reported in 21 countries, and total world production amounted to about 159 Mt. The leading producers of bauxite, in decreasing order of tonnage mined, were Australia, Brazil, Guinea, China, and Jamaica, which accounted for about three-fourths of total world production.

World output of alumina increased 4% in 2004 compared with that of 2003 (table 12). The five principal producing countries, in descending order of quantity of alumina produced, were Australia, China, the United States, Brazil, and Jamaica. These countries accounted for about two-thirds of the world's production; Australia alone accounted for 28%.

Australia.—By yearend, the Government of Queensland had received expressions of interest in the development of the Aurukun bauxite deposit in northeastern Australia from 12 companies. Earlier in the year, the Government passed legislation revoking Alcan Inc.'s lease on the property that it had acquired through its takeover of Pechiney in 2003 (Mining Journal, 2004a).

In response to growing world demand for alumina, all but one of Australia's refineries were either planning upgrades or were in the process of expanding. The expansions could add more than 6 Mt/yr of alumina capacity (Clarke, 2004).

Construction on the first stage of Rio Tinto Ltd.'s wholly owned Comalco Alumina Refinery (CAR) at Gladstone in Queensland was completed 3 months ahead of schedule. Production and shipments of alumina began in November. The refinery was scheduled to reach its capacity of 1.4 Mt/yr of alumina by the end of 2006. The refinery had options to expand capacity to 4.2 Mt/yr (Rio Tinto Ltd., 2005, p. 13, 16).

Alcan announced its decision to proceed with the expansion of its Gove refinery in the Northern Territory. The $1.3 billion investment would increase capacity to 3.8 Mt/yr of alumina from 2.1 Mt/yr. Construction began by yearend and was expected to be completed by 2007 (Alcan Inc., 2004).

Alcoa Inc. began a 600,000 t/yr efficiency upgrade at its Pinjarra alumina refinery. Upon completion, scheduled for yearend 2005, capacity at the facility would increase to 4 Mt/yr (Alcoa Inc., 2004a).

Alcoa began consultations with the public and environmental groups on the proposed addition of a third production unit at its Wagerup refinery. The $1.1 billion investment, if approved, would add about 2 Mt/yr of alumina capacity to the 2.3-Mt/yr refinery (Alcoa Inc., 2004c).

BHP Billiton approved $192 million in upgrades that would add 250,000 t/yr of capacity to its 3.25-Mt/yr Worsley Alumina Pty. Ltd. refinery. The project was scheduled to be completed by the end of the first quarter 2006 and full production achieved by the end of the second quarter (BHP Billiton, 2004).

Kaiser sold its 20% interest in Queensland Alumina Ltd. (QAL) to RUSAL for $401 million in cash and the assumption of Kaiser's $60 million debt. The other shareholders in the 3.9-Mt/yr refinery are Alcan (41.4%) and Rio Tinto (38.6%) (Kaiser Aluminum Corp., 2004a).

Bosnia and Herzegovina.—Magyar Aluminium Rt (MAL) of Hungary acquired a 51% interest in the Bosnian mining company Ridnici Boksita Jajce (RBJ). RBJ owned four bauxite mines but only three were operational. MAL announced plans to increase production at one of the mines to 170,000 t/yr of bauxite from 100,000 t/yr. Production capacity at the other two mines was estimated to be 215,000 t/yr (CRU Alumina Monitor, 2004).

Brazil.—Companhia Vale do Rio Doce (CVRD) and Aluminum Corporation of China Ltd. (Chalco) signed a joint-study agreement for the development of a greenfield alumina refinery in Barcarena near the existing Alunorte refinery. The Aluminio Brasil China (ABC) refinery would have an initial capacity of 1.8 Mt/yr that could be expanded to 7.2 Mt/yr. Bauxite for the project was expected to come from CVRD's Paragominas mining project (Companhia Vale do Rio Doce, 2004).

CVRD also reported that it had acquired the prospecting and development rights for the Pitinga bauxite deposit in Amazonas State from Paranapanema S.A. Preliminary company estimates indicated that the deposit had reserves of between 400 and 600 Mt of metallurgical-grade bauxite (Metal Bulletin, 2004a).

China.—Nanchuan Minerals Group began work on an expansion of its 70,000-t/yr Bosai alumina refinery to 150,000 t/yr by mid-2005. The company also began talks with potential investors on the possible expansion to 500,000 t/yr at a later date (Metal Bulletin, 2004b).

Germany.—Hydro Aluminium AS sold its 50%-interest in Aluminium Oxid Stade GmbH (AOS) and its 10%-interest in Halco Mining Inc. to a United Kingdom-based trading company DADCO Alumina & Chemicals Ltd. Hydro had acquired its share of AOS as part of its takeover of VAW Aluminium AG in 2002, and since most of the output of the 850,000-t/yr refinery was chemical-grade alumina, Hydro did not consider the facility to be a core asset (Hydro Aluminium AS, 2004).

Almatis Inc. announced plans to increase capacity of ground reactive alumina by 50% at its manufacturing facility in Ludwigshafen, Germany. Reactive aluminas are used in refractories and ceramics. The company did not reveal the capacity of the plant (Industrial Minerals, 2004a).

Guinea.—Alcoa, Alcan, and the Government set out the framework for a 1.5-Mt/yr alumina refinery. A detailed feasibility study was expected to be completed in 2005 with construction to begin shortly thereafter. Compagnie des Bauxites de Guinée, which operated bauxite mines in the Boké region of the country, was expected to supply the bauxite for the refinery (Alcoa Inc., 2004a).

Rio Tinto sold its 4% interest in Halco Mining to two other Halco participants, Alcoa and Alcan, thereby increasing their ownership to 45% each (Rio Tinto Ltd., 2004).

Guyana.—Cambior Inc. announced that it had signed an agreement with the Government of Guyana to privatize certain assets of Linden Mining Enterprises Ltd. (Linmine). Cambior, which has been operating Linmine's bauxite operations under contract for the past 4 years, would invest $10 million to acquire a 70% interest in the mine, and the remaining 30% would be retained by the Government. The joint venture would operate under the new company name, Omai Bauxite Mining Inc. (OBMI). Between the third quarter of 2003 and the third quarter of 2004, the mine produced about 122,000 t of refractory-grade bauxite. OBMI planned to double production to 240,000 t/yr during the next 5 years (King, 2004).

India.—National Aluminium Co. Ltd. (Nalco) received Government approval for its phase 2 expansion plans. The project involved increasing capacity at the company's Panchpatmali bauxite mine to 6.3 Mt/yr from 4.8 Mt/yr and increasing capacity at its Damonjodi refinery to 2.1 Mt/yr from 1.58 Mt/yr. Also included in the plans was an expansion of the Angul smelter to 460,000 t/yr. Completion of the project was expected by the end of 2008 (CRU Aluminium Monitor, 2004).

Ireland.—Glencore International AG announced plans to invest $200 million to expand capacity at its Aughinish alumina refinery to 2 Mt/yr from 1.5 Mt/yr. The investment reportedly included the construction of a new heat and powerplant, begun during the year, that would supply 250,000 t/yr of the planned 500,000-t/yr increase in capacity (Cooper, 2004).

Italy.—Sardabauxiti Spa and S&B Industrial Minerals SA reportedly signed an agreement that would enable production to resume at Sardabauxiti's Olmedo Mine in Sardinia. S&B would have exclusive rights to market and sell the Sardinian bauxite in exchange for

its mining, processing, and quality control expertise. The underground bauxite mine had a nameplate production capacity of 300,000 t/yr (Industrial Minerals, 2004c).

Jamaica.—Kaiser sold its 65% interest in the 1.65-Mt/yr Alpart alumina plant to Norsk Hydro ASA for $315 million (Kaiser Aluminum Corp., 2004b). According to an agreement signed in May, Norsk Hydro immediately sold this interest to Glencore at identical terms. Norsk Hydro retained its original 35% interest in the refinery (Norsk Hydro ASA, 2004).

Kaiser also sold its 49% interest in the Kaiser Jamaica Bauxite Co.'s (KJBC) bauxite mining operation to Century Aluminum and Noranda (Century Aluminum Co., 2004a). The Government of Jamaica owned the remaining 51% share. The KJBC operations had the capacity to mine and process 4.5 Mt/yr of bauxite (Century Aluminum Co., 2004b).

Alcoa signed an agreement in principle with the Government of Jamaica to expand the Jamalco refinery in Clarendon by more than 1.5 Mt/yr. The expansion would more than double the refinery's capacity to at least 2.8 Mt/yr. Alcoa's ownership in the refinery would increase to 70% from 50%, and the Government would continue to own the remaining 30%. A final decision on the project was expected in 2005, and if approved, the expansion could be completed by the end of 2007 (Alcoa Inc., 2004b).

Russia.—The European Bank for Reconstruction and Development and the International Finance Corporation each committed $75 million to develop bauxite mining at the Siberian-Urals Aluminum Co.'s (SUAL) Komi Aluminum project. The $150 million would be spent on expanding bauxite mining operations and building a rail track. The Komi Aluminum project included increasing capacity at the Sredne-Timan bauxite mine to 6 Mt/yr from 1 Mt/yr to feed a planned 1.4 Mt/yr alumina refinery to be built near Sosnogorsk (Interfax Mining & Metals Report, 2004a).

RUSAL announced that it had won the right to explore and develop three bauxite deposits in the Severnaya Onega Group in the Arkhangelsk region of Russia. The deposits—Plesetsk, Denislavsk, and Iksinsk—had proven and indicated reserves of 300 Mt, 17 Mt, and more than 500 Mt of bauxite, respectively. The bauxite would supply RUSAL's existing alumina refineries after adjustments have been made to the existing refinery technology to enable them to handle this particular type of bauxite. The construction of a new refinery in the vicinity of the deposits was also under consideration (RUSAL, 2004).

Ukraine.—The Government of Ukraine reportedly agreed to a RUSAL proposal to increase capacity at the Nikolayev Alumina Plant (NGZ) to 1.6 Mt/yr from 1.3 Mt/yr. The proposed refinery expansion would replace RUSAL's previous commitment made in 2002 to build an aluminum smelter in Ukraine in exchange for its purchase of a 30% interest in NGZ (Interfax Mining & Metals Report, 2004b).

Outlook

World aluminum supply appears to be adequate to meet future growth in demand. Announced brownfield and greenfield expansions will replace and supplement announced and anticipated smelter closures. The effects of production and consumption in China on the world aluminum industry is still the unanswered question. An increase in the long-term demand for aluminum in China is expected, but whether the increased demand will be met by domestic or foreign supply has yet to be determined.

Shortages in alumina supply continued into 2005; refinery expansions scheduled to come onstream in 2006 and beyond, however, should help to ease these shortages and to reverse the recent rise in alumina spot and contract prices.

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TABLE 1
SALIENT BAUXITE STATISTICS[1]

(Thousand metric tons)

	2000	2001	2002	2003	2004
United States:					
Production, crude ore (dry equivalent)	NA	NA	NA	NA	NA
Value	NA	NA	NA	NA	NA
Exports (as shipped):					
Crude and dried	133	67	27	55	42
Calcined	9	14	15	22	21
Imports for consumption (as shipped):					
Crude and dried	8,550	8,300	7,340	8,390	10,000
Calcined	310	242	237	307	341
Consumption (dry equivalent)	10,800	9,770	9,980	11,300 r	13,500
World, production	136,000	137,000 r	144,000 r	155,000 r	159,000 e

eEstimated. rRevised. NA Not available.

[1]Data are rounded to no more than three significant digits.

TABLE 2

ESTIMATED PRODUCTION AND SHIPMENTS OF ALUMINA IN THE UNITED STATES[1]

(Thousand metric tons)

Year	Calcined alumina	Other alumina[2]	Total	
			As produced or shipped[3]	Calcined equivalent
Production:				
2003	4,380 r	709	5,090 r	4,860 r
2004	4,990	529	5,520	5,350
Shipments:				
2003	4,380 r	711 r	5,090 r	4,870 r
2004	5,000	716	5,720	5,490

rRevised.

[1]Data are rounded to no more than three significant digits.

[2]Trihydrate, activated, tabular, and other aluminas. Excludes calcium and sodium aluminates.

[3]Includes only the end product if one type of alumina was produced and used to make another type of alumina.

TABLE 3

CAPACITIES OF DOMESTIC ALUMINA PLANTS, DECEMBER 31[1, 2]

(Thousand metric tons per year)

Company and plant	2003	2004
Alcoa Inc., Point Comfort, TX	2,300	2,300
BPU Reynolds, Inc., Corpus Christi, TX	1,600	1,600
Kaiser Aluminum Corp., Gramercy, LA[3]	1,250	1,250
Ormet Corp., Burnside, LA	600	600
Total	5,750	5,750

[1]Capacity may vary depending on the bauxite used.

[2]Data are rounded to no more than three significant digits; may not add to totals shown.

[3]Purchased by Century Aluminum Co. and Noranda Inc. in October 2004.

TABLE 4
U.S. CONSUMPTION OF BAUXITE, BY INDUSTRY[1]

(Thousand metric tons, dry equivalent)

Industry	2003	2004
Abrasive	53	53
Alumina	10,600	12,500
Cement[2]	424	441
Chemical	W	W
Refractory	150	260
Other[3]	112	258
Total	11,300 [r]	13,500

[r]Revised. W Withheld to avoid disclosing company proprietary data, included with "Other."
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Data from the D15-Cement Annual Survey Form, U.S. Geological Survey Form 9-4041-A.
[3]Includes municipal water works, oil, and steel and ferroalloys.

TABLE 5

STOCKS OF BAUXITE IN THE UNITED STATES, DECEMBER 31[1, 2]

(Thousand metric tons, dry equivalent)

Sector	2003	2004
Producers, processors, consumers	3,830 [r]	3,120
Government	66	--
Total	3,900	3,120

[r]Revised. -- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Domestic and foreign bauxite; crude, dried, calcined, activated, all grades.

TABLE 6

STOCKS OF ALUMINA IN THE UNITED STATES, DECEMBER 31[1, 2]

(Thousand metric tons, calcined equivalent)

Sector	2003	2004
Producers	414 [r]	408
Primary aluminum plants	833 [r]	870
Total	1,250	1,280

[r]Revised.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Excludes consumers stocks other than those at primary aluminum plants.

TABLE 7

AVERAGE VALUE OF U.S. IMPORTS OF CRUDE AND DRIED BAUXITE[1]

(Dollars per metric ton)

	2003		2004	
Country	Port of shipment (f.a.s.)[2]	Delivered to U.S. ports (c.i.f.)[3]	Port of shipment (f.a.s.)[2]	Delivered to U.S. ports (c.i.f.)[3]
Australia	16.91	41.19	11.19	29.97
Brazil	20.45	27.02	22.71	36.82
Guinea	20.04	26.24	21.85	28.08
Guyana	25.24	32.56	28.41	35.26
Jamaica	17.30	19.79	18.36	22.34
Weighted average	19.48	24.53	22.50	30.80

[1]Computed from quantity and value data reported to U.S. Customs Service and compiled by the U.S. Census Bureau, Department of Commerce. Not adjusted for moisture content of bauxite or differences in methods used by importers to determine value of individual shipments.

[2]Free alongside ship valuation.

[3]Cost, insurance, and freight valuation.

TABLE 8
U.S. IMPORTS FOR CONSUMPTION AND EXPORTS OF BAUXITE, CRUDE AND DRIED, BY COUNTRY[1]

(Thousand metric tons)

Country	2003	2004
Imports:		
Australia	96	127
Brazil	837	2,550
Guinea	2,870	2,320
Guyana	736	1,110
Jamaica[2]	3,810	3,340
Other	44	550
Total	8,390	10,000
Exports:		
Canada	17	21
China	35	(3)
Mexico	(3)	12
Other	3	9
Total	55	42

[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Dry equivalent of shipments to the United States.
[3]Less than ½ unit.

Note: Total U.S. imports of crude and dried bauxite as reported by the U.S. Census Bureau were as follows: 2003—7,700,000 metric tons (t) and 2004—8,500,000 t.

Sources: U.S. Census Bureau and the Jamaica Bauxite Institute.

TABLE 9

U.S. IMPORTS FOR CONSUMPTION AND EXPORTS OF CALCINED BAUXITE, BY COUNTRY[1]

(Thousand metric tons and thousand dollars)

	2003				2004			
	Refractory grade		Other grade		Refractory grade		Other grade	
Country	Quantity	Value[2]	Quantity	Value[2]	Quantity	Value[2]	Quantity	Value[2]
Imports:								
Australia	--	--	70	6,330	12	1,050	80	8,010
Brazil	3	355	14	1,030	--	--	7	524
China	69	5,730	102	8,040	116	15,300	88	7,570
Guyana	17	2,150	31	2,010	36	4,440	--	--
Other	(3)	17	(3)	10	1	52	(3)	11
Total	90	8,250	217	17,400	165	20,800	176	16,100
Exports:								
Canada	2	431	4	392	5	648	5	306
Japan	(3)	4	--	--	--	--	--	--
Mexico	7	988	7	1,010	1	114	9	1,340
Other	1	582	(3)	7	1	199	(3)	340
Total	11	2,010	11	1,410	7	961	14	1,990

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Value at foreign port of shipment as reported to U.S. Customs Service.

[3]Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 10

U.S. IMPORTS FOR CONSUMPTION AND EXPORTS OF ALUMINA, BY COUNTRY[1]

(Thousand metric tons, calcined equivalent, and thousand dollars)

	2003		2004	
Country	Quantity	Value[2]	Quantity	Value[2]
Imports:				
Australia	962	163,000	816	180,000
Brazil	78	21,800	32	16,400
Canada	95	63,100	106	70,500
China	26	8,260	7	3,570
France	12	17,800	18	23,100
Germany	40	74,600	40	72,000
Jamaica	361	72,300	60	14,200
Japan	6	13,500	4	14,200
Suriname	719	121,000	543	115,000
Venezuela	2	1,770	(3)	250
Other	11	13,500	25	23,200
Total	2,310	571,000	1,650	533,000
Exports:				
Brazil	2	2,510	2	3,220
Canada	897	198,000	144	65,300
China	35	11,400	493	118,000
Finland	(3)	125	(3)	632
Mexico	38	22,100	54	25,800
Netherlands	1	7,640	14	10,900
Norway	63	9,890	303	62,000
Russia	(3)	536	(3)	868
Sweden	1	1,510	1	1,700
Other	52	114,000	217	151,000
Total	1,090	368,000	1,230	439,000

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Value at foreign port of shipment as reported to U.S. Customs Service.

[3]Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 11

BAUXITE: WORLD PRODUCTION, BY COUNTRY[1, 2]

(Thousand metric tons)

Country	2000	2001	2002	2003	2004[e]
Australia	53,802	53,799	54,135 [r]	55,602	56,593 [3]
Bosnia and Herzegovina[e]	75	75	113 [r]	115 [r]	115
Brazil	13,866	13,388 [r]	13,148 [r]	18,457 [r]	18,500
China[e]	9,000	9,800	12,000	13,000 [r]	15,000
Ghana	504	678	684	495	498 [3]
Greece	1,991	2,052	2,492	2,418	2,444 [3]
Guinea[4]	15,700	15,100 [e]	15,700 [r]	16,000 [r]	16,000
Guyana[4]	2,471	1,950	1,690	1,716 [r]	1,500
Hungary	1,047	1,000	720	666	647 [3]
India	7,562	7,864	9,647	10,414 [r]	11,285 [3]
Indonesia	1,151	1,237	1,283	1,263 [r]	1,331 [3]
Iran[e]	400 [3]	405	420	500	500
Jamaica[4, 5]	11,127	12,370	13,120	13,444	13,296 [3]
Kazakhstan	3,730	3,685	4,377	4,737	4,706 [3]
Malaysia	123	64	40	6 [r]	6 [3]
Mozambique	8	9	9	12	7 [3]
Pakistan[e]	9 [3]	9	8	8	--
Russia[e]	4,200	4,000	4,500 [r]	5,500 [r]	6,000
Serbia and Montenegro	630	610	612	590 [r, e]	600
Suriname	3,610	4,394	4,002	4,215	4,052 [3]
Turkey[6]	459	242	287	364 [r]	366 [3]
United States	NA	NA	NA	NA	NA
Venezuela	4,361	4,585	5,191	5,446 [r]	5,500
Total	136,000	137,000 [r]	144,000 [r]	155,000 [r]	159,000

[e]Estimated. [r]Revised. NA Not available. -- Zero.

[1]World totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Table includes data available through July 25, 2005.

[3]Reported figure.

[4]Dry bauxite equivalent of crude ore.

[5]Bauxite processed for conversion to alumina in Jamaica plus kiln-dried ore prepared for export.

[6]Public-sector production only.

TABLE 12

ALUMINA: WORLD PRODUCTION, BY COUNTRY[1, 2, 3]

(Thousand metric tons)

Country	2000	2001	2002	2003	2004[e]
Australia	15,680	16,313	16,382	16,529	16,700 [4]
Azerbaijan	63	95	91 [r]	180 [r]	300
Bosnia and Herzegovina[e]	50	50 [4]	50	50	50
Brazil	3,743	3,445	3,962	5,111 [r]	5,100
Canada	1,023	1,036	1,125	1,109 [r]	1,170
China[e]	4,330	4,650	5,450	6,110 [r]	7,000
France[e]	200 [4]	150	150	150	100
Germany[e]	652 [r]	600 [r]	720 [r]	830 [r]	800
Greece	667	679	750	750	750
Guinea	541	674	670	732	740
Hungary[e]	357 [r]	300 [r]	294 [r]	300 [r]	300
India[e]	2,280	2,400	2,800	2,500	2,600
Iran	--	--	102	200 [e]	200
Ireland[e]	1,200	1,100	1,100	1,100	1,100
Italy[e]	950	500	500	500	500
Jamaica	3,600	3,542	3,631	3,844	4,023 [4]
Japan[5]	369	331	333	330	340
Kazakhstan	1,217	1,231	1,386	1,419	1,468 [4]
Romania	417	319	361 [r]	333 [r]	350
Russia	2,850 [e]	3,046	3,131	3,230	3,269 [4]
Serbia and Montenegro	186	201 [r]	237 [r]	225 [r]	250
Slovakia[e]	110	110	112 [r]	132 [r]	130
Slovenia[e]	70	34	30	30	30
Spain[e, 6]	1,200	1,100	1,100	1,100	1,100
Suriname[e]	1,800	1,900	1,900	2,000	2,000
Turkey	155	146	152	162 [r]	170
Ukraine	1,360	1,343	1,351	1,434	1,563 [4]
United Kingdom	80 [e]	84	74	--	--
United States	4,790	4,340	4,340	4,860 [r]	5,350 [4]
Venezuela	1,755	1,833	1,901 [r]	1,840 [r]	1,900
Total	51,700 [r]	51,600 [r]	54,200 [r]	57,100 [r]	59,400

[e]Estimated. [r]Revised. -- Zero.

[1]Figures represent calcined alumina or the total of calcined alumina plus the calcined equivalent of hydrate when available; exceptions, if known, are noted.

[2]World totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[3]Table includes data available through July 25, 2005.

[4]Reported figure.

[5]Data presented are for alumina used principally for specialty applications. Information on aluminum hydrate for all uses is not adequate to formulate estimates of production levels. Production of aluminum hydroxide, in metric tons: 2000—781,690; 2001—739,098; 2002—723,860; 2003—740,000 (revised estimate); and 2004—730,000 (estimated).

[6]Hydrate.